

obviate the need for a fixing arm for fixing the parts on the opposite side of the optical scale on the theoretical basis, there is no portion projecting to the outside from the outside periphery of the optical scale D and this decreases the total size and the number of components. The displacement information can be detected with good contrast by the compact structure.--

IN THE CLAIMS:

Please amend Claims 16, 18, and 34 to read as follows. A marked-up copy of the amended claims, showing the changes made thereto, is attached.

16. (Amended) An optical encoder comprising:

light irradiating system;

an optical scale comprising scale slits of a periodic structure;

a light-receiving element; and

an optical system constructed so as to make light traveling from said light irradiating system to the scale slits of a first region of said optical scale, incident to the scale slits of a second region of said optical scale by a mirror or another optical element to guide the light having passed via the scale slits of the second region to said light-receiving element;

wherein in said optical scale the scale slits of said first and second regions are comprised of grooves of V-shaped cross section and wherein the V-shaped grooves of the scale slits in said second region comprises slopes of N types of angles in one period and each slope has a width of $P/2N$, where P is a pitch of the periodic structure of the scale slits and N a natural number.

18. (Amended) An optical encoder comprising:

light irradiating system;

an optical scale comprising scale slits of a periodic structure;

a light-receiving element; and

an optical system constructed so that light traveling from said light irradiating system to the scale slits of a first region of said optical scale and reflected by the first region is condensed via only one condensing mirror onto the scale slits of a second region of said optical scale and is reflected by the second region so as to be guided to said light-receiving element.

34. (Amended) A driving system comprising:

a driver system;

a control system for controlling driving of said driver system; and

an optical encoder for detecting information on the driving of said driver system to output a signal to said control system, said optical encoder comprising:

(1) light irradiating system;

(2) an optical scale comprising scale slits of a periodic structure;

(3) a light-receiving element; and

(4) an optical system constructed so as to make light traveling from said light irradiating system to the scale slits of a first region of said optical scale, incident to the scale slits of a second region of said optical scale by a mirror or another optical element to guide the light having passed via the scale slits of the second region to said light-receiving element;